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ABSTRACT

While it is generally simple to make electronic content accessible, it is also easy inadvertently to make it inaccessible. This guide covers the many formats of electronic documents and points out what to keep in mind and what procedures to follow to make documents accessible to all when disseminating information via the World Wide Web and on CD-ROM. Specifically, the guide addresses: (1) the advantages of Web and CD-ROM technology for making information accessible to individuals with disabilities; (2) making HyperText Markup Language (HTML) pages accessible; (3) organizing and presenting information; (4) linking pages on other World Wide Web sites and within the same site; (5) deciding whether to have one Web page or multiple Web pages and the advantages and disadvantages; and (6) document formats including software specific document formats and electronic document formats, such as portable document formats and HTML. A list of 11 resources addressing accessibility is included. (CR)

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PUBLISHING ACCESSIBLE MATERIALS ON THE WEB AND CD-ROM

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Introduction

While it is generally simple to make electronic content accessible, it is also easy to inadvertently make it inaccessible. As this guide covers the many formats of electronic documents, it will point out what to keep in mind and what procedures to follow to make your documents accessible to all when disseminating accessible information via the World Wide Web and on CD-ROM.

Traditional Document Publishing

For many centuries, the predominant means of publishing has been paper. Paper is what we're familiar with. We can hold it and flip through its pages. However, paper-based publishing is not accessible to all. It has been a problem for people who are blind. They must have someone read the document to them or obtain a copy that has been translated into Braille or recorded on audiocassette. Similarly, individuals with reading disabilities find print difficult to use. And people with limited movement may find the pages hard to turn.

Paper publications can be bulky, cumbersome and heavy and are often a burden to carry around. Paper is also hard to search. Tables of contents and indices make documents easier to search, but it can be a slow task to find exactly what you're looking for.

Technology Assists People With Disabilities to View and Interact With Electronic Documents

Technology is closing the gap for people with disabilities. They now have access to more information than ever before. Computers are used to read electronic documents out loud to individuals who are unable to read or have difficulty reading, whether due to blindness or reading disabilities. Others with limited vision can control the display of their electronic documents so that the text is enlarged or the colors are changed. Documents can be printed in Braille for easy reference when a computer is not available. Microphones can be used to input text and share it with the world. Software can be used to assist people with reading and learning disabilities improve their reading skills by helping them focus on text as they're reading it or it's being read by a computer.

Electronic Publishing on the World Wide Web and CD-ROM

Electronic publishing offers an alternative to paper while still permitting paper documents to be generated on an as needed basis for those who are more comfortable reading paper or when paper is more practical.

Publishing documents on the World Wide Web (Web) allows documents to be distributed more widely, updated easily, printed on-demand by the people who want them, and, through the use of technology, accessed by individuals with disabilities.

Types of Information You Can Publish In This Way:
Books, directories, laws and regulations, training documents, conference presentations, hand-outs, flyers, forms, and indices are some examples of content that can be published electronically.

Documents designed to be published on the Web can easily be published on CD-ROM (CD) as well. CDs allow access to documents when an Internet connection is not available. They are lightweight and inexpensive to distribute. They are equally as accessible as Web sites and still allow print on-demand.

Section 508

On August 7, 1998 the Rehabilitation Act Amendments of 1998 were signed into law. This Act governs access to federally funded programs and services. Section 508 of this Act requires access to electronic and information technology provided by the Federal government. It also governs Federal government procurement practices, requiring agencies to purchase accessible electronic and information technology.

In effect, Section 508 requires that all electronic information produced for the Federal government (and/or purchased by the Federal government) be accessible to individuals with disabilities. Read the full text of Section 508 of the Rehabilitation Act at http://www.access-board.gov/508.htm

On June 21, 2001, accessibility standards developed by Section 508 went into enforcement. The standards can be found at http://www.access-board.gov/sec508/508standards.htm They cover various means of disseminating information, including computers, software, and electronic office equipment. They provide criteria that spell out what makes these products accessible to people with disabilities, including those with vision, hearing, and mobility impairments.

Advantages of Web and CD-ROM Technology

The key advantages of creating documents formatted specifically for the Web is that they are intrinsically available to people on all types of computers and can easily be made accessible. In the past, it could be difficult to share a document created on a Macintosh with someone on a PC or vice-versa. Through the Web, this limitation goes away.

Electronic documents offer greater accessibility over print material. Computerized assistive technology can allow people with a variety of disabilities to access them. Huge electronic documents can weigh nothing, if available on the Web, or ounces if on CD-ROM. And searching is a fast and easy way to find exactly what you're looking for.

Advantages of the Web

- Cost is nearly the same for one person as one million people
- No shipping/mailing costs
- Readily accessed by anyone anywhere in the world
- Information is easily updated at any time.
- Content can be published in pieces as it's ready.
- Content can be published in several different formats, such as text only, PDF, HTML, and word processing formats.
- Content is viewable on many different computer platforms including PCs running Microsoft Windows and Apple Macintosh computers.
- Flexible access - viewers with disabilities can use assistive technology tools to have content read out loud, enlarge text, turn text into Braille, highlight text as it's read, and/or turn pages.
- Color can be used to enhance understanding and is no more expensive than black-and-white.
- Quick and easy navigation and searching; readers can search for exactly what they're looking for.
- Viewer can print only pages needed.
- Printing costs assumed directly by the user

Advantages of CD-ROM

- Lower cost than print especially at high volume
- Lower shipping costs
- Very portable and lightweight
- No Internet access required
- Content can be viewed on PCs (Windows) and Macintosh if CD is created properly.
- Less expensive than print to publish a new edition
- As with the Web, CD content can be in multiple formats and provide for flexible access, easy navigation, and print control.

For the most part, electronic documents being published on a Web site can all be published on a CD as well. You can write (known as "burn") the same contents you're putting on your Web site onto your CD.

If your CD is being created for a large audience, chances are that some of your readers will use PCs (MS Windows) and some will use Macintosh. When you burn your CD it is important that you make sure you create it to work on both MS Windows and Macintosh - cross- or multi-platform.

Making HTML Pages Accessible

It's important to keep accessibility in mind as you design your pages.

- Make sure all graphics are described with alternative text or a link to a description page
- Make sure that all audio and video files have text transcriptions
- Make sure equivalent text content exists for any non-text content on a page (such as rollovers, Java applets, Flash movies, etc.)
- Offer a text only navigation bar, where all major site links can be found in one place
- Create a linked table of contents at the top of each long page for easy navigation
- Make sure colors contrast
- Use a consistent design throughout your site
- Don't make things flash, blink, or move around the screen causing a distraction
- Make sure the content is viewable on all computers with a variety of screen sizes.

Organizing and Presenting Information

If you want your Web and CD content to be useful, it must be well organized. If people can't find what they're looking for or can't easily discern what the purpose of your site is, they will not use it.

Before you begin to build a Web site / CD spend time thinking about your content and how best to organize it. Decide on categories or themes that your content falls into. Give each theme a succinct yet meaningful name. Decide which pages fall under each theme and how you will navigate between them. Make sure there will be a way to navigate to all of your content including your non-HTML document formats.

Just as it's important to organize your site well, it is also important to offer a clear and understandable presentation.

As you organize your content, keep in mind that Web site users rarely read a site linearly as they would a book. You have very little control over what order content will be read. They may even arrive to your site via a page somewhere in the middle of your page structure. Therefore, if content refers to content on another page or assumes an understanding of other site content, be sure to create a hyperlink to that other content so the reader can easily get the required context.

Figuring out all of this before you begin to actually build your Web site will save you time in future edits and will ensure a well thought out and more user-friendly site.

Just as it's important to organize your site well, it is also important to offer a clear and understandable presentation. Design a home page that will offer a nice presentation of your themes and perhaps a short description of each. Make sure you are using colors that work well together but also offer enough contrast for readability. Don't be afraid of "whitespace." Content with spacing in between is far more readable and attention-getting than content that has been crammed in. Don't distract your visitors with moving images and text.

Make the pages on your site look like they belong together. Keep the navigation, use of fonts, and colors consistent so people only have to learn your navigation scheme once and won't get confused into thinking they've left your site.

Links to Pages on Other World Wide Web Sites and Within the Same Site

Paper documents often include a bibliography and/or additional resources section so that a reader wanting more information can locate the referenced document or other resources. One advantage of hyperlinks is the ability to link directly to other sections within the same Web site or to other Web sites where that information might live.

TestingYour Web Site

It is important to always well test your Web site. You'll want to make sure:

- The content prints without cutting off.
- It works in both Internet Explorer and Netscape Navigator. Be sure to test current and older versions.
- It works on PCs (running Microsoft Windows) and Macintosh.
- It works with assistive technology such as screen readers.

Two helpful online resources on Web accessibility are:
http://www.w3.org/WAI
The Web Accessibility Initiative, and
http://www.cast.org/bobby
This site allows you to test your Web page for accessibility.

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One Web page vs. Many

HTML pages are not the same as paper pages. One Web page may print on any number of paper pages. A 1000 paper page document could be created on a single Web page. This is not recommended but it can be done quite easily. In fact, if you use word processing software to save a document in HTML, this is exactly what it will do. It will create one, possibly giant, Web page out of your document.

Advantages of One Web Page

- If the reader is likely to want to print the whole document together, printing is simplified.
- The document is more likely to be read top-to-bottom.
- It can be easier to read a document top-to-bottom than having to click on a series of links.

Disadvantages of One Web Page

- If a page is large, it will take a long time for the entire page to load onto the reader's computer and may encounter a network error before the page is completely loaded.
- If the reader prints the page, they may unknowingly print a large number of paper pages. If they only needed a section, this may waste a lot of paper and printing time.
- If they reach the page as the result of a Web search or site search, the term they were looking for may be hard to find. They will then need to use the browser's Find capability to find what they're looking for. (While Web users have gotten quite good at searching, many seem to forget, or don't realize, that they can use their browser's Find function to locate a term once they've arrived to a page.)
- There are fewer pages to be indexed by search engines. The likelihood of finding your Web site is reduced.

Advantages of Multiple Web Pages

- Pages load faster.
- You can organize the content in "chunks" that it makes sense to print and/or find as the result of a search.
- There are more pages to be indexed by search engines and therefore an increased likelihood of being found.

Disadvantages of Multiple Web Pages

- Harder to print the whole document.
- Readers who want to read the whole document may need to click on a lot of links.

Given the advantages and disadvantages, it's important to carefully consider an organization that makes sense for your document. There is not one correct answer. You'll want to consider whether the information is useful as independent "chunks" or whether it is better read top-to-bottom. Do you want search engines or other Web sites jumping into the middle of your content? Is the content likely to be printed? Will the reader want to print the entire document or just a section?

You should always provide a table of contents with links to all of your document Web pages, as well as a small table of contents at the top of each Web page with links to all sections on that Web page. It is also useful to provide next and previous links on the bottom of each page.

You may wish to achieve all of the advantages of multiple Web pages along with the advantages of one web page by providing two versions of the same document. You can have a link from your multi-page Web document to a page designed for printing. If you do this, you'll need to make sure any updates get applied to both versions.

Document Formats

Software Specific Document Formats

There are times when it makes sense to provide a document created in a software specific format, e.g. Microsoft Word, Excel, PowerPoint, Adobe PageMaker, on your Web site or CD. This is especially useful if you are providing your readers with a document that they may want to customize such as a spreadsheet template or PowerPoint slides.

If you decide to provide a software specific format, it's important to understand that some of your readers may not have compatible software or a compatible computer and will not be able to view or modify your document.

If your readers will have no need to modify your document, you may instead wish to provide it in PDF format instead of the software specific format it was originally created in. This will allow access by people who don't own the software you created the document in while maintaining exact formatting and layout.

If you have a Word processing format that you'd like to share with your readers for editing but want to provide as much software compatibility as possible, use your word processing software to save your document in RTF (rich text format) format. This format was designed to be compatible with almost all word processing software and unlike Text Only format, maintains formatting such as header styles and tables.

Advantages

- Can be edited by reader
- Formatting stays as originally created.

Disadvantages

- Can be edited by reader
- Reader may not be able to view it if they don't have compatible software or computer.
- If there's no browser plug-in for file type, reader must either install the appropriate plug-in or save the file to their computer and then open it.
- Accessibility will depend on the formatting of the document and software application's compatibility with accessibility tools.

Links to Software Specific and Other Non-HTML Documents

For maximum accessibility and usability, include documents in multiple formats. Browsers are made to display HTML documents. If you create a link to a non-HTML document, such as a PDF or Microsoft Word document, the browser may display a Save dialog that allows the reader to save (download) the document onto their computer. They can save the document and then open it with the required software. (Note that most browsers now provide plug-in support that allows them to open many of these formats directly.)

The strength of this type of link is that ANY type of document can be provided to the reader for download

Electronic Document Formats

Whether you're publishing your content on the Web or on a CD or both, you'll want to consider publishing your documents in each of the electronic formats described below. These formats work on both of these mediums.

Text Only

Content stored in text only format, is simply that — only text. It has no formatting such as bold, italics, different fonts, font sizes, and colors. It contains no illustrative graphics or pictures, no tables, and no page formatting such as information about margins, and page headers and footers. It contains only text, spaces, and carriage returns. This is the most basic format you can store a document in. Documents stored in this format usually have file names that end in .txt.

While this should never be the only format you offer, it is certainly worthwhile to include on your Web site and/or CD for people with disabilities or slow Internet connections who will find it useful. Because this format is so simple, it is universally readable by any computer or assistive technology software and its file size is as small as possible, and therefore the quickest file format to download over slow Internet connections. A disadvantage of this format is it does not include graphics or charts and can be difficult to read as it contains no formatting, color, or visual cues of any sort.

Making Text Only Documents Accessible

Text only documents are intrinsically accessible to assistive technology devices by the fact that they are simply text and have no complex formatting. However, they are less usable since they don't include information about the structure of the content or allow for easy navigation. For accessibility for everyone you should never offer your document solely in Text Only format.

Almost all word processing software offers the ability to save a document in Text Only format.

PDF (Portable Document Format)

While you can put files created with word processing, spreadsheet, publishing, presentation and other software (e.g. Microsoft Word, Corel WordPerfect, Microsoft Excel, Adobe PageMaker, Microsoft PowerPoint) on the World Wide Web and CDs, it is important to keep in mind that they can only be viewed by people who have the required software and correct software versions on their computers.

Portable Document Format (PDF) was created so that documents created with almost any software can be saved in a format that almost anyone on any computer can view using the free Adobe Acrobat Reader software.

Creating PDF files

PDF files are created using the Adobe Acrobat software. (Note that this is different from the free Reader software and must be purchased separately.) Once you've installed the software, you create a PDF file by choosing the Print command in your software. Instead of printing to your printer you print to Acrobat PDFWriter.

PDF documents can be viewed and printed from almost any computer using free software. All formatting of the original document stays intact and looks as good as it did in original software. The content of a PDF format can easily be made accessible to people with blindness or low vision due to its flexibility.

A disadvantage to using PDF documents is that Web browsers cannot read them directly. The Adobe Acrobat Reader software must be installed on the computer of the person who wants to view the document. (Since Adobe Acrobat Reader software is free and since it is commonly used, at this time, most people have the required software installed on their computers. In case they do not, it is always smart to include a link which takes them to the Adobe Web site where they can download and install the free software.)

Making PDF Documents Accessible

PDF documents that contain anything other than simply formatted text e.g. tables, charts, drawings, photographs, etc. are not inherently accessible. You will need to use the accessibility tools that come with Adobe Acrobat or can be obtained from Adobe to make your non-text only PDF documents accessible. Refer to the resource section at the end of this guide to access detailed instructions on how to make your PDFdocuments accessible.

HTML (HyperText Markup Language)

The pages you view on the World Wide Web are created using a language called HTML. It's similar to English with lots of abbreviations and <'s and >'s. You can see what HTML looks like by:

1. Opening a Web page with a Web browser.
2. Choosing the View Source option in the View menu.

Publishing your content in HTML will allow you to take full advantage of the features of the Web and Web browser software.

Some of the advantages of publishing in HTML are that the content can be viewed and printed from almost any computer using free browser software, which allows it to be made accessible to people with disabilities. Hyperlinking allows quick and easy access to sections of a document as well as to other resources located on the Web.

There are disadvantages to HTML as well. Hyperlinking can help organize document content but can make it difficult to print a document – the reader must visit many different pages and print each. Care must be used in creating pages to make sure they're accessible. Content is more difficult to edit than if created in word processing software such as Microsoft Word or Corel WordPerfect.

HTML documents should always be designed to not require a width greater that 800 pixels (640 pixels is even better for greater accessibility). The 800 pixel limitation is important because a document that requires more than that will not print properly on a 8 ½" wide sheet of paper. Content that extends beyond the 800 pixels will simply be cut off. It is important to always give your readers the option of reading from print if they wish. Additionally, the pixel width required by a document is important to consider because it is very difficult to read a document that requires both horizontal and vertical scrolling.

Resources

General Web Site Accessibility

The World Wide Web Consortium (W3C) sets guidelines for Web content developers as well as the developers of browsers and other Web-related software. A key initiative of the W3C is the Web Accessibility Initiative (WAI). WAI has several documents that can guide you through developing accessible content.

Web Accessibility Initiative Home Page
http://www.w3.org/WAI/
Web Content Accessibility Guidelines 1.0
http://www.w3.org/TR/WCAG10/
Techniques for Web Content Accessibility Guidelines 1.0
http://www.w3.org/TR/WCAG10-TECHS/
Alternative Web Browsing
http://www.w3.org/WAI/References/Browsing

Is Your Web Site Accessible?
http://www.blrry.com/accessible/
Provides a checklist of things to think about as you create your Web pages and explains the issues, with examples.

CAST (Center for Applied Special Technology)
http://www.cast.org
"..uses technology to expand opportunities for all people, including those with disabilities."
Visit their site at to learn about the technologies they've developed and about Universal Design for Learning. Bobby (http://www.cast.org/bobby/), is a free product that will help you test your site to make sure it is accessible.

EASI (Equal Access to Software and Information)
http://www.rit.edu/~easi/index.htm
Has an extensive list of assistive technology (adaptive hardware and software) at:
http://www.rit.edu/~easi/resource.htm

Trace Research Center's Designing More Usable Web Sites page
http://www.trace.wisc.edu/world/web/

The CPB/WGBH National Center for Accessible Media (NCAM) Web Access Project
http://ncam.wgbh.org/

WebABLE
http://www.webable.com/

Adobe PDF Accessibility

Visit http://access.adobe.com/ to access several documents that explain how to create accessible PDF documents including an explanation of the compliance of Adobe's PDF format with Section 508.

How to Create Accessible Adobe PDF Files, 2001 Adobe Systems Incorporated
http://access.adobe.com/whitepaper1.html

Accessibility Law

Section 508
http://www.access-board.gov/508.htm

Electronic Information Technology Accessibility Standards

http://www.access-board.gov/sec508/508standards.htm

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